

BOOK46R

Notes:

-these pages have been hand-numbered

Blank pages: page opposite page 1, 2, 4, 7, 8, 10, 12, 14, 16, 18, all pages past 19 are blank.

-1 (8.5x11) sheet in front of book

-page 3 has 1 sheet taped to it

-page 13 has 1 calendar sheet dated 5/6/64 between pages 12/13

Scanned by:

Sheila Finch

RSICC /Oak Ridge National Lab.

August 12, 1999

Foils

1965
Borrow - UCHINWA
Solutions



from 7/28/58

page 9 ft

COMPOSITIONS

NAME _____

Provine

7/23/50 5/16" Au foils on hand -

CLASS PROGRAM

NAME _____ ADDRESS _____

SCHOOL _____ CLASS _____

		PERIOD 1	PERIOD 2	PERIOD 3	PERIOD 4	PERIOD 5	PERIOD 6	PERIOD 7	PERIOD 8
TIME	FROM								
	TO...								
MONDAY	SUBJECT								
	ROOM								
	INSTRUCTOR								
TUESDAY	SUBJECT								
	ROOM								
	INSTRUCTOR								
WEDNESDAY	SUBJECT								
	ROOM								
	INSTRUCTOR								
THURSDAY	SUBJECT								
	ROOM								
	INSTRUCTOR								
FRIDAY	SUBJECT								
	ROOM								
	INSTRUCTOR								
SATURDAY	SUBJECT								
	ROOM								
	INSTRUCTOR								

MANUFACTURED BY S. E. & M. VERNON, INC., NEW YORK, U. S. A.

7/28/58 Rec'd from DWM

V Series 47.5mg (3/16") Au foil

#'s 32, 34, 36, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47

W - Series

31 thru 47 47.6mg

FOIL FACTORS FOR B-SERIES *INDIUM*

<u>Foil</u>	<u>Factor</u>	<u>Foil</u>	<u>Factor</u>
1	1.073	18	1.013
2	1.020	19	1.012
3	.951	20	.987
4	.955	21	1.099
5	1.007	23	.995
6	1.010	24	1.005
7	.986	25	.992
8	.989	26	.971
9	.998	27	1.022
10	.987	28	1.001
11	1.018	29	1.020
13	1.005	30	.988
14	.954	31	1.002
15	.985	32	1.003
16	1.031	33	1.020
17	1.004	34	1.033

FOIL FACTORS FOR UO₂F₂ CAPSULES

<u>Foil</u>	<u>Factor</u>	<u>Foil</u>	<u>Factor</u>
1	1.000	13	.828
3	.812	15	1.084
5	.6775	17	.833
6	1.000	18	.859
9	.7765	19	.859
10	1.000	20	1.010
11	.828		

Uranium Foils

93% catcher foils = 10 mil \times 1.4" OD with $\frac{1}{8}$ " hole (center)

2951
3046
3047
3118
3135
3136
3137
3044

Note: See East End logbook for wgt.

1. U^{238} foil 2" in diam ? into tubes

37.5% catcher foils = 1.4" OD \times 0.01" thick ($\frac{1}{8}$ " center hole)

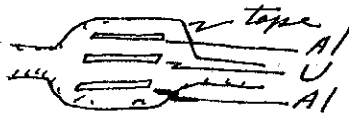
25 discs - total wgt = 117.46 gm

37.5% direct foils = $\frac{5}{16}$ " OD \times 0.002 in

No.'s 1-15 enclosed in teflon tape (pressure sensitive)

with 2 mil Al sheet on each face =

Number on Al.



16 foils - unencased in tightly closed bottles

($\frac{5}{16}$ " \times .002")

169.5 gms of 2 mil foil from which
foils were punched

Also 12.87 gms (net) of U_3O_8 (37.5% enrichment)

8-16-60

On removing foil package from desiccator (each 95% foil in glass envelope + most of 37% foil - some 37% foils in a manila envelope) - foils began to react with atmosphere - generating enough heat to cause the paper to smoulder - Paper foils + all dumped into a 4 liter beaker of CCl₄ -

Saber foils washed in dilute HNO₃, and separated according to enrichment by alpha counting - 8 enriched 93% foils - and 24 medium enrichment - one U²³⁵ foil -

total U involved =
$$\begin{array}{r} 235 \\ 37\% = 117.46 \text{ gm} \\ 93\% = \underline{32} \\ 0\% = \underline{6.5} \\ \hline 156.0 \text{ gm} \end{array}$$

No attempt is being made to separate assays at present - D.H. Lewis

Note: letter rewritten by A. D. Callahan + also H. Phipps because of a contamination of desk + floor.

For Tests with SPERT-D 9

Elements

1965
1/18-1/19- Heated two amples reagent
(H₂O 6.84%)
(Aqueous U(92.4)O₂(NO₃)₂ soln at ~48 U²³⁵/l)

Grade H₃BO₃ at 120°C overnight.

Observed weight loss ~ 30%

1/19 Sample from reagent (684439) H₃BO₃ showed 18.32 wt% B
" " " (684438) B₂O₃ showed 21.02 wt% B
(reported 1/19 DIM by Jamison).

1/19 [Stock mixture quantities - 17.5 wt% B in H₃BO₃
31.1 wt% B in B₂O₃]

∴ of above (1/19) amples - B₂O₃ must
contain moisture + probably H₃BO₃
contains B₂O₃.

1/19 Before receiving results of analysis of dried
samples (above) to 500 cc of 4g²³⁵U/L UO₂(NO₃)₂
solution was added 1.385 g "H₃BO₃"
~~1.0779 g~~

(Target + water not clear) -

This solution sampled (684440) +

showed 0.0734 wt% B ; $\rho_{sp} = 1.001$

$$\therefore 0.0734 \times 1.001 \times 10^{-2} \times 10^3 = 0.735 \text{ g B/L}$$

$$\approx 0.368 \text{ g B / 500 cc}$$

$$\therefore 1.385 \text{ g "H}_3\text{BO}_3\text{" dried contained } 0.368 \approx 26.6\%$$

1/20 - Established a target of 0.4 g
 on basis of undred H_3BO_3 analysis
 this requires $1.09 \left(\frac{0.2}{0.1832} \right)$ g H_3BO_3
 per 500 cc.

Actual amount of H_3BO_3 added
 to 500 cc = 1.0779 g -
 (ie $1.0779 \times 0.1832 = 0.1975$ g B)

Sampled (684441) -

Results 0.0384 w B $\rho = 1.0033$ g/cc

$$\frac{0.384 \text{ g B}}{100 \text{ g sol}} \times 1.0033 \frac{\text{g sol}}{\text{cc sol}} \times 10^3 \frac{\text{cc}}{\text{L}}$$

$$= 0.384$$

$$= 0.384 \text{ g B/L}$$

≈ 0.192 g B/500 cc to be

compared to 0.1975 g above -

In an attempt to establish limit
 of solubility (at room temp.) of
 H_3BO_3 in $(49/L)$ $UO_2(NO_3)_2$ solution
 H_3BO_3 was added to the
 0.735 g B/L solution described as p 9 -

MAY 1964						
S	M	T	W	T	F	S
				1	2	
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

WEDNESDAY

6

MAY

- 127 1/25 PM Sample from 239
 Tank → 6.8 g (2 a/c)
- 1/25 AM Sample for tank
 5 g
- 1/22 PM 1st sample from tank
 5 g (1.5 a/c)
- 1/20 - Tank "out" ml
- 1/20 - Tank 0.5
- 1/19 SE → 0.0734 wt % SW
- 1/19 - Day sheet

1/20/65

13

+ 406 cc
 H_3BO_3 was added until crystals
 failed to dissolve - this requires
 5.467 g of H_3BO_3 -

Total B content then

$$\begin{aligned} & (5.467 \times 0.1832) + (406 \times 0.735) \\ & = 1.299 \text{ g B in } 406 \text{ cc} \\ & \approx 3.20 \text{ g B/L.} \end{aligned}$$

Sampled (6.84442)

Results

$$\begin{aligned} & C = 1.0058 \text{ g/cc} \\ & 0.2915 \text{ wt } \% \text{ B} \\ & 0.2915 \times 10^{-2} \times 1.0058 \times 10^3 \\ & = 2.932 \text{ g B/L.} \end{aligned}$$

92

1/20

To the ^{400 cc}
 A 0.384 g B/L solution (1511)
 was added 42.7 g H_3BO_3 .
 (Nominal concentration $\frac{(42.7 \times 0.1832) + (400 \times 0.384)}{400}$)

~~= 0.4036 g B/L~~

= 19.94 g B/L -)

Requires heating to go into solution.

1/21 - Decided to make H_3BO_3 solution
in 45^{225} L UO_2NO_3 solution
at $\sim 208 B/L$, heat, & add to ⁶⁴⁰ 600 L tank -

Prepared 4 batches each 3.2 L of UO_2NO_3 sol

$$\frac{4 \times 3.2 \times 20}{0.1832} = 1397.4 \text{ g } H_3BO_3 \text{ to}$$

make to 20 g/L.

$$\left[\frac{640 \times 0.4}{0.1832} = 1397.4 \text{ g } H_3BO_3; \text{ i.e.} \right.$$

$$\left. 12.8 \text{ L @ } 20 \text{ g/L} \equiv 640 \text{ L @ } 0.4 \text{ g/L} \right]$$

Mass of H_3BO_3 added to 12.8 L (22)

This sample included the "residue" = 1346.98 g

left after sampling the
solutions p. 13, top p. 13, bottom Sampled (684443) =

(A-950) =

1/25 AM Resampled because Hc not quite same as on 1/22

Sampled (684444) =

(A-256) =

1/25 Decided to increase conc. of 600L to 0.65B/L.
 i.e. increase the concentration by 50% -
 so add 1/2 of mass of H_2BO_3 added
 on 1/21 -

$$\text{i.e. } 1/2 \text{ of } 1397.4 = 698.7 \text{ g} -$$

Actually added 704.7 g to ~6L -
 heated to put in solution
 added to 600L tank -

1/25 (PM) Sampled

$$\text{Req } 684445 \equiv$$

$$(A 857) \equiv$$

1/26 To increase conc. to $\sim 0.88/L$

\therefore add, ^{approx.} ~~B~~ same amount of B as on 1/25 -

700.974 g H_2BO_3 added to "645" liters.

(About half this salt came from an old bottle)

1/27 To increase concentration to $\sim 0.9 g/L$

added 271.547 g H_3BO_3 + 68.106 g B_2O_3

1/28/65 To increase concentration to $\sim 1.1 g B/L$

added ⁹499.147 g B_2O_3 + 125.580 g H_3BO_3 .



COMPOSITION BOOKS

No.	LVS.	RYLING
101-40	40	Wide Faint - Margin
101-60	60	Wide Faint - Margin
101-P-60	60	Plain - Unruled
101-Q-54	54	Quad (5 to the inch)
101-72	72	Wide Faint - Margin
104-120	120	Wide Faint - Margin

This Book
No. 101-72

THE COVERS OF THIS BOOK HAVE BEEN TREATED WITH A
SPECIAL VARNISH THAT PROTECTS AGAINST MOISTURE AND RUBBING
NOTICE HOW SMOOTH THEY ARE

THE PAPER HAS BEEN SPECIALLY SELECTED FOR A SMOOTH WRITING SURFACE,
AND UNIFORM QUALITY, WHICH MAY BE IDENTIFIED WITH THE WATERMARK

LOOK FOR THE WATERMARK IN THE PAPER

Royal Writing